

**SECTION M6****ROADSIDE DEVELOPMENT MATERIALS****M6.00.0 General.**

This section shall contain materials used for soil conditioning, seeding, general planting, and care of plants.

**M6.01.0 Limestone.**

Limestone shall consist of pulverized limestone obtained by grinding either calcareous or dolomitic limestone so that 95% of the material will pass a 850 micrometer sieve and at least 50% will pass a 150 micrometer sieve. The limestone shall have a neutralizing value satisfactory to the Engineer, and shall be only such as will have been marketed in accordance with those provisions of General Laws, as amended, which relate to commercial fertilizers.

**M6.02.0 Fertilizer.**

Fertilizer shall be furnished in containers plainly marked with the chemical analysis of the product.

Fertilizer for grass seeding shall have the following composition by mass.

10-20-10

Nitrogen (N)	10% Minimum
Available Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> )	20% Minimum
Water Soluble Potash (K <sub>2</sub> O)	10% Minimum

Fertilizer for general planting shall be commercial grade 10-10-10.

No fertilizer shall be used which has not been marketed in accordance with the provisions of General Laws, as amended, relating to fertilizers.

**M6.02.1 Bone Meal.**

Bone meal shall be fine-ground, steam-cooked, packing house bones with a minimum analysis of 23% phosphoric acid and 1.0% of nitrogen by mass.

**M6.03.0 Seed.**

Grass seed shall be of the previous year's crop and in no case shall the weed seed content exceed 1% by mass. The grass seed shall conform to the requirements of the following tables:

	Proportion	Germination Minimum	Purity Minimum
For Grassplots & Islands			
Creeping Red Fescue	50%	85%	95%
Kentucky Blue	25%	85%	90%
Domestic Rye	10%	90%	98%
Red Top	10%	85%	92%
Ladino Clover	5%	85%	96%

For Slopes & Shoulders

Creeping Red Fescue	50%	85%	95%
Kentucky 31	30%	85%	95%
Domestic Rye	10%	90%	98%
Red Top	5%	85%	92%
Ladino Clover	5%	85%	96%

The seed shall be furnished and delivered premixed in the proportions specified above. All seed shall comply with State and Federal seed laws.

The seed mixture specified for slopes and shoulders consists of a tough hardy type for use on slopes graded at the rate of 1:4 (1 vertical to 4 horizontal), and steeper slopes, and on shoulders adjacent to the roadway pavement or as otherwise directed. The mixture for grass plots is of a finer type which will produce finer turf.

A manufacturer's Certificate of Compliance to the specifications shall be submitted by the manufacturers with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net mass and date of shipment. No seed may be sown until the Contractor has submitted the certificates.

**M6.03.1 Erosion Seed.**

This seed shall consist of a mixture of the previous year's crop and shall contain the following mixture by weight with 98% purity:

Seed	% by Mass	% Germination Minimum
Winter Rye	80 minimum	85
Red Fescue (Creeping)	4 minimum	80
Perennial Rye Grass	3 minimum	90
Red Clover	3 minimum	90
Other Crop Grass	0.5 maximum	
Noxious Weed Seed	0.5 maximum	
Inert Matter	1.0 maximum	

A manufacturer's certificate of compliance will be required as specified in Subsection M6.03.0 above.

**M6.04.0 Mulch.**

Materials to be used in mulching shall conform to the following requirements:

**M6.04.1 Hay Mulch.**

Hay Mulch shall consist of mowed and properly cured grass, clover or other acceptable plants. No salt hay shall be used.

**M6.04.2 Straw Mulch.**

Straw Mulch shall consist of stalks, or stems of grain after threshing.

**M6.04.3 Wood Chip Mulch.**

Wood chip mulch shall consist of wood chips produced by cutting branches, limbs of trees, brush or shrubs with chippers or from the chipping of stumps free of topsoil, stones, etc. The chippers shall be approved for use by the Engineer. Wood chip mulch must be free from long stringy material (defined as 100 millimeters in length maximum) and preferably shall be from live growth, except that 35% or less by volume of the wood chip mulch may consist of "slabwood", chipped to an acceptable size by chippers equipped with a 6 millimeter knife set and thoroughly mixed with the live material. The percentage of "slabwood" in the mixture shall be determined by the Engineer.

Wood Chip Mulch containing an excess of fine particles, in the judgment of the Engineer, will not be acceptable for use on the Project.

Wood Chip Mulch may be produced on the project from acceptable cuttings.

**M6.04.4 Wood Fibre Mulch.**

Wood Fibre Mulch shall consist of wood fibre produced from clean, whole uncooked wood, formed into resilient bundles having a high degree of internal friction and shall be dry when delivered on the project.

**M6.04.5 Aged Pine Bark Mulch.**

This mulch shall consist of the outer bark of pine trees and a minimum of hardwood bark. Bark shall be processed by removal from the limbs and trunks of trees in the production of lumber and woodchips for paper mills.

This bark or a combination of the bark from various trees must be thoroughly mixed and be allowed to cook and become properly aged in a stock pile for a minimum period of six (6) months. The bark must be partially decomposed and dark brown in color, free of chunks and pieces of wood thicker than 6 millimeters.

Mulch must be free from long stringy material.

Aged Pine Bark Mulch containing an excess of fine particles, in the judgment of the Engineer, will not be acceptable for use on the Project.

**M6.05.0 Sod.**

Collected Natural Growth Sods shall be 300 millimeter x 300 millimeter collected sods 100 or more millimeters in thickness with the kind of plant specified in the item predominating. Natural growth sods shall have 3 or more woody stems of native plants with natural soil clinging to the roots, such as may be obtained near the edge of the woods or along hedgerows. Native plants may consist of sheep laurel, lowbush blueberry, sweetfern and evergreen seedlings, collected from northern areas of the United States.

Mountain Laurel Sods shall have natural growth clumps of Laurel approximately 250 millimeters in height and 200 millimeters in spread. The sod shall be approximately 200 millimeters in diameter and 150 millimeters in depth. Larger plants in healthy condition will be acceptable.

**Field Sod**

Shall consist of satisfactory pasture field sods. The sods shall have a healthy root system at least 50 millimeters in thickness. Measurement for thickness shall exclude top growth and thatch. All sods shall be free from noxious weeds and coarse, burned or bare spots. All broken, dried or otherwise damaged sods shall be rejected as unsatisfactory.

**Lawn Sod**

Shall be composed of the grass mixture as recommended by the New England Sod Producer's Association and shall be specified as:

		Percent by mass	
No. 1	For sunny turf areas		Kentucky Bluegrass - one or more of these varieties:
	Kentucky Bluegrass	50 - 100%	Merion
	Red Fescue	0 - 50%	Fylking
			Pennstar
			Windsor
			Baron
No. 2	For shady turf areas		
	Kentucky Bluegrass	10 - 25%	Red Fescue:
	Red Fescue	75 - 90%	Highlight Jamestown or
	Poa trivialis	0 - 10%	Pennlawn
No. 3	For multi-use turf areas		
	Tall Fescue	80 - 100%	Kentucky 31
	Kentucky Bluegrass	0 - 20%	
	Perennial Ryegrass	0 - 20%	Manhattan

Lawn sods shall have been nursery grown on cultivated agricultural land specifically for sod purposes.

The sods shall be free of objectionable grassy and broad leaf weeds. Sods shall be considered free of such weeds if less than 5 such plants are found per 10 square meters of area.

The sod shall be machine cut at a uniform minimum thickness of 20 millimeters at the time of cutting. Measurement for thickness shall exclude top growth and thatch.

Individual pieces of sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be 5%. Broken pads and torn or uneven ends will not be acceptable.

#### **M6.06.0 General Planting.**

Materials to be used in this work shall conform with the following requirements:

##### **Nomenclature:**

All scientific and common plant names of the items specified shall conform with the current edition of *Hortus Third*, compiled by the staff of the L.H. Bailey Hortorium, Cornell University. These standards shall determine all requirements of acceptable shrub and seedling nursery stock. All plants delivered shall be true to name and legibly tagged. Caliper or spread shall govern over height specifications. The Contractor must obtain written permission from the Engineer for any substitutions for the types and sizes specified.

##### **Delivery and Protection:**

All plants shall be packed so as to arrive at the delivery point in good growing condition.

Delivery of plants and seedlings shall be made to the site, only according to the Contractor's ability to handle and properly care for them.

##### **Sources of Material:**

A. Nursery Stock shall be grown at nurseries in the Northern area of the United States for a minimum of two years, and shall conform with the requirements of Subsection M6.06.1 below.

B. Collected Plants shall be carefully dug from approved locations and retain a root system or ball at least 25% larger than that specified for Nursery Stock.

#### **M6.06.1 Nursery Stock.**

All nursery stock shall conform to the current edition of the "American Standards for Nursery Stock" as sponsored by the American Association of Nurserymen, Inc.

All plants shall be fully representative of their normal species or varieties unless otherwise specified. All plants must have a good, healthy, well-formed upper growth; a fibrous compact root system; and must be free from disease, injurious insects, mechanical wounds either fresh or healed, broken branches, decay or any other defect; and shall be legibly tagged with their names.

All plant materials shall be dug with reasonable care and skill immediately prior to shipment.

Coniferous Evergreens shall be dug before spring "candling" of new growth.

Special precautions shall be taken to avoid any unnecessary injury to or removal of fibrous roots. Each species or variety shall be handled and packed in the approved manner for that particular plant having regard to the soil and climatic conditions at the time and place of digging, transit and delivery, and to the time that will be consumed in transit. All precautions that are customary in good trade practice shall be taken to ensure the arrival of the plants at the site of the project in good condition for successful growth.

All plants which are to be balled and burlapped previous to shipment are designated: "B & B". Balled and burlapped plants shall be lifted so as to retain as many fibrous roots as possible. The burlap shall be untreated 275 grams/square meter burlap and firmly held in place by a stout cord or wire. Nails shall not be used except in the case of broad-leaved evergreens or other similar plants. All plants that are balled and burlapped shall come from soil which will hold a firm ball and the solidity of the ball shall be carefully preserved.

The roots of bare-rooted material shall be carefully protected with wet straw, moss or other suitable material which will ensure the arrival of the plants at the site of the work in good condition.

**Deciduous Trees:**

The sizes of these trees shall be as called for on the plans and measurements shall be made by caliper at a point 300 millimeters above the collar.

a) Non-flowering trees shall have been transplanted 3 times, the last transplanting within 2 years. They shall have a single straight leader not cut back. They shall have a symmetrical development of strong, healthy branches beginning 1.5 meters to 2 meters from the ground; and below this point, the trunk shall be clean for street trees, although park trees will be permitted to branch lower.

b) Flowering trees shall have been transplanted twice, the last transplanting within 2 years. The trunk shall be clean and straight up to the first branch, which shall be about 1 meter from the ground. Grafted and budded trees may branch lower and be pruned off 600 millimeters from the ground where directed. Flowering trees shall be balled and burlapped and kept moist for delivery.

**Deciduous Shrubs:**

Deciduous shrubs shall be fully representative of their species and variety. They shall have been transplanted twice; the last transplanting within 2 years. They shall have 4 to 6 branches coming from the roots, shall have a well-branched root system and shall be of good size for the height and specified.

**Evergreen Trees:**

Evergreen trees shall have been transplanted 3 times, the last transplanting within 2 years. They shall have a good colored top growth and shall be balled and burlapped and kept moist for delivery. Evergreen trees shall conform to AAN specifications; specified spread shall govern over height requirements.

**Evergreen Shrubs:**

Evergreen shrubs shall have been transplanted twice and shall have a heavy dark-green foliage. They shall be of the size indicated on the plans and, except where noted, each clump shall have not less than 4 stems. Plants shall be balled and burlapped and kept moist for delivery.

**Vines and Trailers:**

Vines and ground cover in this group shall be 2 year No. 1 stock unless otherwise indicated on the plans.

**Herbaceous Perennials:**

Herbaceous plants in this group shall be 3 year stocks, and clumps shall have not less than 6 buds, eyes or crowns.

**Seedlings:**

Seedlings shall have well developed root systems and shall be acclimated and suitable in all respects for field planting. All conifers must have dormant buds and secondary needles.

Evergreen seedlings shall be two (2) year transplants, bare rooted.

Lining out stock seedlings shall be two (2) year seedlings.

Root cuttings shall be established in peat pots 65 millimeters deep by 50 millimeters wide at the open end and tapered to 25 millimeters wide at the closed end (inside measure).

**M6.07.0 Tree Paint.**

The paint furnished under this specification shall be suitable for application by brushing on sawed, cut or bruised surfaces of living trees, for the purpose of disinfection and protection of these surfaces.

The raw materials from which this paint is manufactured shall be as follows:

1. Asphalt: Shall conform to the requirements of AASHTO M 18, Grade A.
2. Creosote: Shall be a distillate of coal-gas tar or coke-oven tar, conforming to AASHTO M 133.
3. Fibrous Magnesium Silicate Pigment: Not less than 97% passing through a 45 micrometer screen by mass.

Composition:

Asphalt	40 - 70%
Creosote	20 - 30%
Fibrous Magnesium Silicate	10 - 15%
Volatile Thinner	0 - 15%

The proportions of the various ingredients shall be chosen within the above limits to yield paint of medium brushing consistency.

**M6.08.0 Materials for Guying and Staking.**

**For Type I (a) and (b) Staking**

The stakes shall be unpainted spruce or other suitable wood free from large knots, dimensioned 50 millimeters x 50 millimeters x 2.5 meters.

Binding straps shall be 2.7 millimeters diameter galvanized steel wire.

Stake fastenings shall be 10 penny galvanized nails.

**For Type II Guying**

The guy wire shall consist of 3.5 millimeter diameter double-galvanized steel wire.

The anchor stake shall be made from locust, cedar or other suitable hard wood and shall be at least 600 millimeters in length and 50 millimeters x 50 millimeters in cross section.

Protective hose required to cover the wires used for Type I and II staking and guying shall be approved commercial 13 millimeters High Pressure reinforced hose and a minimum length of 200 millimeters.

**M6.09.0 Wrapping Material.**

Wrapping Material for tree trunks shall be 100 millimeter to 150 millimeter wide strips of burlap, paper or plastic manufactured for this purpose. Fastening for the wrapping material shall be either adhesive weather resistant tape or a minimum of 3-ply jute twine.

**M6.10.0 Water for Irrigation.**

Water used for irrigation of plant materials shall be free from any substance injurious to vegetation, such as oil, acids, alkalis and salts.